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ABSTRACT

This paper discusses factors that may influence the acceptance of automated counseling procedures by the military. A consensual model of the change process is presented which structures organizational readiness, the change strategy, and acceptance as integrated variables to be considered in a successful installation. A basic introduction to the principles of software psychology is presented and previous research is considered. A structured approach for the installation of automated military counseling procedures is proposed, taking into account planned change, software psychology, and previous practical experience. A preliminary organizational assessment instrument for use in the installation of automated counseling procedures is described in detail. (Author/JAC)

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Improving Acceptance of Automated Counseling Procedures

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In order to successfully install a computerized counseling system, it is necessary to consider a range of factors that can effect the project's outcome. The assessment of organizational readiness, structured implementation procedures, strategies for handling resistance, and system design features are all crucial variables in this process. The purpose of this paper is to beiefly review these areas to aquaint interested psychologists with a number of new developments in the field.

Organizational Readiness

The new technology of planned change emerged from a rational analysis of the forces that encourage and impede change. When an innovation is planned, the forces within the "target" organization must be understood and then developed to channel them for a successful implementation process. Davis (1971) used the acronym AVICTORY to describe the dimensions of organizational readiness that a "change agent" must consider in designing a plan for action. The target group must have the ability, that is the skills and resources, necessary to change. The innovation must be consistant with the values and operating style of the target. Information about the innovation must be provided. Other circumstances of the target should be considered so that the timing of the plan is optimal. Important personnel must feel the need or obligation to change. Sources of resistance to change must be anticipated. The yield, benefits and cost-effectiveness, should be clarified. Byrnes and Johnson (1981) constructed a questionaire based on Davis AVICTORY model to assess an organization's readiness for an automated system. Table 1 summarizes the dimensions of this questionnaire.

Table 1. A VICTORY Dimensions for Organizational Readiness for Automation

Category		
Ability	1	Emergence of a system's advocate, that is, someone who identifies the need for an automated system and will work to push it through.
	2	Power base of the organization is supportive of implementation.
	3	Availability of resources for automation.
Values	4	Administrative support and cooperation.
	5	Attitudes and beliefs of users toward automation.
	6	Organizational and administrative style.
	7	Organization's flexibility and openness to change.
Information	8	Availability of appropriate computer programs or computer science expertise.
	9	Presence of comparable manual system.
Circumstances	10	A climate of trust is needed so that communication can be facilitated.
Timing	11	High priority is being given to the automation project.
Obligation	12	Sources of motivation are present, internal and/or external, for automation.
Resistance	13	Fears of confidentiality, performance appraisal, and mechanization. Expected negative consequences of automation.
Yield	14	General staff and administration both foresee the benefits of automation.

Change Strategies

Strategies to effect planned change should be chosen and combined according to the assessed characteristics of the target organization. Power strategies, that is the imposition of sanctions and rewards to change behavior, are recommended when staff commitment to the project is low and/or the time frame is limited. Persuasive strategies, convincing the target group that the change serves its purposes, are suggested when the need or problem is not recognized or the innovation is not considered acceptable. Reeducational strategies, aimed at changing attitudes and values, are useful when commitment to the change is minimal and a long time frame is possible. Facilitative strategies which provide assistance for easier implementation, are recommended as an augmentation to other strategies (Zaltman & Duncan, 1977). Table 2 suggests types of issues to be considered in choosing strategies.

Previous reports about attempts to install automated procedures for psychological purposes suggest that failure to consider such factors has often led to serious installation problems and even rejection of innovative systems (Johnson, Williams, Giannetti, Klingler, & Nakashima, 1978; Hedlund, Sletten, Evenson, Altman & Cho, 1977; St. Clair, Siegel, Caruso & Spivack, 1976; Leader & Klein, 1977; Landau & Wilkes, 1975).

Software Psychology

To facilitate acceptance of an automated system the users' comfort and ease in operating the computer are important. Certain design features can be varied to develop a system appropriate to the users' level of experience with computers. More "powerful" commands and more "flexible" commands (that is commands that permit the user to perform an operation with fewer instructions or with a variety of types of commands, respectively) are less demanding of users (Ramsey & Atwood, 1979). Such command patterns should be balanced by a low level of "complexity" so that only a few commands need to be used at one time (Stewart, 1976). Computer-initiated dialogue reduces the amount of learning necessary to operate the computer, thereby reducing errors. Examples of computer-initiated dialogue are "yes or no" questions, "form-filling" (short answer), and "menu selection" (multiple choice) (Thompson, 1971; Martin, 1973). Although appropriate for inexperienced users, such procedures restrict the communication of information. To accomodate increasingly experienced users a "dual mode dialogue" which allows switching to a user-initiated approach is recommended (Pew & Rollins, 1975).

Programs can be designed to give messages to the user to guide interactions. Abmbiguous input can be resolved by presenting the user with alternative interpretations from which he/she can choose further commands (Plath, 1972; Codd, 1974). Patterns of errors can be detected and "instruction" for correcting such errors can be presented (Rouse, 1977). The pace of all such guidance should be programmed to be under the user's control (Goodwin, 1974).

Table 2. Sample Questions for Surveying Change Strateties Used During Implementation Processes

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Power/Coercion

-Were top administrators used effectively before and during the implementation process?
-Was the administrative staff well educated about computer approaches?
-Would the chief administrator have penalized an employee who failed to cooperate with the needs of the automated system?
-Was the chief administrator propared for resistance to change prior to the implementation process?

Persuasion

-Were staff involved in all stages of the design and implementation process?
-Were there full-time liaison personnel to work with the staff?
-Were computer science trained personnel carefully exposed to psychologist's concepts prior to beginning work on the project?
-Were staff opinion leaders identified and involved in the installation of the computer system?

Reeducation

-Were numerous meetings and workshops held between the prospective users and project staff?
-Were key staff members given training in data processing?
-Were members sent to other facilities with automated systems for purposes of education?
-Was a computer project staff member assigned responsibility for user education?

Facilitation

-Was the project given adequate financial support?
-Did the design of the system attempt to minimize organizational change?
-Were chief administrators supporting the project?
-Were additional staff provided to allow sufficient total involvement during implementation?

When recruits or enlisted personnel are to use the computer, special care must be taken to ensure that collected data are accurate. Personnel unable to use a computer should be screened out. Johnson et al (1977) have constructed such a screening device. A period of orientation and practice should be allowed before data collection begins. Standardized responses and specially marked or color coded keys are suggested to make computer interaction easier. Design should allow for storage of partial data if a user is unable to complete a program in a single setting (Cole, Johnson & Williams, 1976).

A design that allows staff easy access to stored information expands the usefulness of the system for purposes of monitoring, documentation, program evaluation, and planning. System monitoring programs provide records of errors for ongoing evaluation and refinement of the system.

Approaches found to facilitate interpretation of output data are: graphics (Schniederman, 1980), data summary displays (Ramsey & Atwood, 1979), coding by color, brightness, size and grouping (Stewart, 1976; Teichner, Christ & Corso, 1977), and flashing important data (Smith & Goodwin, 1971). Output of printed reports can be varied in size, type, and style according to the users' needs. Alternative sentence stems can be varied so that each report is structurally unique. Retrofit programming techniques (fitting data from disparate collection procedures backwards around key data) produces unified reports that readers seem to like better (Johnson et al., 1977).

Important physical design features include: alternative keyboards to accomodate typers and non-typers (Schniederman, 1980; Hirsch, 1976), computer response time appropriate to the user's perception of task difficulty (Schniederman, 1980), yellow displays to reduce eye strain (Ramsey & Atwood, 1979), and elimination of flicker which causes fatigue and dissatisfaction (Dill & Gould, 1970). Detailed design guidelines applicable to psychological settings have been developed by Hanson (1971), Wasserman (1973), Pew & Rollins (1975), Gaines & Racey (1975), and Schniederman (1980).

All factors facilitating user ease of operation and comfort with the computer should be considered to enhance efficiency and encourage acceptance of the system. These considerations are an important part of the facilitative implementation strategy.

Suggested Implementation Procedures

Keeping in mind the organizational readiness, strategy, and design features discussed above, the following step-by-step implementation procedure is suggested.

Step 1: Assessment. Systems developers should review the change technology and software psychology literature in order to acquire the orientation and skills (information and ability) necessary to contribute to the design of an implementation plan. The organizational readiness instrument (described above) is suggested to determine potential problems and resistances. The relationship between permanent personnel and temporary implementation staff should be clarified to alleviate resistance due to fears of loss of power (Jones, 1969). Meetings would be scheduled to obtain design input from staff (values), to deliniate the problems

of the current system (establish obligation) and the rationale for an automated solution (demonstration yield). These procedures should ensure optimum participation by opinion leaders (who can best evaluate circumstances and plan timing). Opinion leaders need to become "insiders" who are supportive of the proposed change and who can use their influence over other personnel to overcome resistances (Zaltman & Duncan, 1977).

Step 2: Plan design. The goals of the program must be clarified to make them consistant with the organization's values and to form the basis for later evaluations. Software and hardware should be selected based on organizational needs and the facilitation of user acceptance. Duties of all personnel must be deliniated. Procedures for feeding information about problems back to superiors should be described. In this manner a foundation can be developed for the rewards and sanctions of a power strategy.

Expressions of resistance are useful information in evaluating and refining design of the system. Resistance that is not openly expressed, but is only acted upon, is a serious implementation problem. Thus, it is necessary to define procedures for constructive expression of resistance. Planning and accepting resistance in a positive manner will increase involvement of personnel in the project, shift social support toward project success, discourage passive resistance, and provide necessary information for program evaluation and modification (Kelman & Warwick, 1973; Johnson et al., 1978).

Details about scheduling and training groups should be determined in advance to avoid disruption of organizational functioning and to form working units based on level of training needed and ability to provide support for the program's success.

Step 3: Training Personnel. Attendance at all training meetings should be required (power). Arrangements need to be made to adjust work loads during this period so that training dows not result in extra work (facilitation). Opinion leaders should be used in an orientation program to explain the rationale for the automated system (persuasive/reeducative strategy) and to allow staff to become familiar with the new equipment in a casual way (facilitation). Training sessions should be presented in small, successive steps to guarantee learing paced to the users' skill level. Extensive practice sessions often need to be scheduled (St. Clair et al., 1976).

Step 4: Ongoing training and evaluation. Temporary staff should be phased out and/or used on a consulting basis during this period. Monthly meetings and workshops need to be scheduled to solicit feedback regarding resistance, to inform personnel of progress and adjustments in the system, thus demonstrating yield and responsiveness to values expressed (Hedlund et al., 1977). These meetings provide a forum for continued persuasion and re-education of the staff over long periods of time, as well as to facilitate the program by continually increasing user skills.

Summary

To summarize, there are a number of factors related to the successful implementation of a computerized military counseling system that need to be considered. By assessing organizational readiness, and carefully structuring implementation procedures, a plan can be developed that will have the greatest probability of acceptance and success. It is recommended that all developers of computerized approaches pay careful attention to these factros if they wish maximum acceptance of their systems.

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